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Clarence E. Thomas

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BAKER BOTTS L.L.P.

PATENT DEPARTMENT

98 SAN JACINTO BLVD., SUITE 1500

AUSTIN, TX 78701-4039

EXAMINER

LEE, HWA S

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8, 10-12, 33, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aziz et al (US 5,640,270).

For claims 1 and 8, Aziz et al (Aziz hereinafter) show interferometric apparatus and method comprising:

an illumination lens (22) operable to focus a reference beam;

a beam splitter (24) optically coupled to the illumination lens by the reference beam; and

a reference mirror (26) located at a waist of the reference beam and optically coupled to the illumination lens via the beam splitter such that the reference beam is reflected from the reference mirror to the beam splitter.

Although Aziz may not expressly state the functional use of the elements, such as the use of word “operable”, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably

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distinguish the claimed invention from the prior art. As presently claimed, there is no structural difference.

With regards to the limitation “to eliminate the need for a reference objective on a reference arm,” that limitation does not further define the structure of the holography system . In addition the intention of using a reference mirror to eliminate the need for a reference objective does not further define the structure of the system. Aziz shows a structure of an illumination lens, a beam splitter, and a reference mirror located at a waist of the reference beam and oriented relative to the beam splitter and the illuminating lens such that the reference beam is reflected from the reference mirror to the lens and then to the beam splitter.

With regards to the method claim 8, “eliminating the need for...” only states the achievement of the invention which is not a method step. Therefore, there is no difference to the steps of claim 8 which is drawn to a method. Aziz shows the step of focusing a reference beam with an illumination lens, the step of transmitting at least a portion of the reference beam through a beam splitter, and the step of reflecting the portion of the reference beam.

With regards to claim 2, Aziz shows the beam splitter to be a cube beam splitter.

With respect to claim 3, Official Notice is taken that the use of quarter wave plates in an arm of an interferometer is well known. Interferometers utilizing polarized light is advantageous for improving signal quality by improving the difference between the measurement and reference beams, and the use of a quarter wave plate is known so that the reference beam will match the

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measurement beam. A half wave shift is required to interfere and by using a quarterwave plate the reference beam having gone through the quarterwave plate twice (once to the reference mirror, and once returning from the reference mirror) will under a half wave shift such that the polarization matches the measurement beam.

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With respect to claims 4 and 12, Aziz does not expressly show the beams are Gaussian. Aziz however teaches the system is able to use phase-shifting interferometry (column 3, lines 26+), and Official Notice is taken that it is well known to use a laser for it's coherent properties in phase-shifting interferometry. Furthermore, Official Notice is taken that lasers having a Gaussian pattern is well known and readily available. At the time of the invention, one of ordinary skill in the art would have used a laser having a Gaussian pattern since they are readily available and would have used the laser for phase shifting interferometry as suggested by Aziz.

With regards to claim 5, Aziz shows the reference mirror comprises a flat mirror .

With regards to claims 6 and 11, Aziz shows the reference mirror operable to maintain optical symmetry of a reference arm and a target arm.

With regards to claims 7 and 10, the reference mirror would be inherently operable to form a first wavefront substantially similar to a second wavefront formed by the reference objective.

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With respect to claim 33, the claim does not further limit claim 8 drawn to a method by reciting a step or manipulatively further defining a previously recited step. The claim merely recites a capability (“operable to”) of the reference mirror, and thus Aziz meets the limitation of claim 33.

With respect to claim 34, the claim does not further limit claim 8, which is drawn to a method, by reciting a step or manipulatively further defining a previously recited step. The claim merely recites the structure of the reference mirror, and thus Aziz meets the limitation of claim 34.

Response to Arguments

3. Applicant's arguments with respect to claims 1-8, 10-12, 33, and 34 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Hwa S. Lee whose telephone number is 571-272-2419. The examiner can normally be reached on Tue-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur R. Chowdhury can be reached on 571-272-2800. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hwa S. Lee (Andrew)/
Primary Examiner, Art Unit 2886

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